ABSTRACT OF THE DISCLOSURE

A physical neural network is disclosed, which comprises a liquid state machine. The physical neural network is configured from molecular connections located within a dielectric solvent between pre-synaptic and post-synaptic electrodes thereof, such that the molecular connections are strengthened or weakened according to an application of an electric field or a frequency thereof to provide physical neural network connections thereof. A supervised learning mechanism is associated with the liquid state machine, whereby connections strengths of the molecular connections are determined by pre-synaptic and post-synaptic activity respectively associated with the pre-synaptic and post-synaptic electrodes, wherein the liquid state machine comprises a dynamic fading memory mechanism.